

REMARKS

Applicant has studied the Office Action dated December 23, 2008, and has made amendments to the claims 22 and 23. It is submitted that the application, as amended, is in condition for allowance.

Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks are respectfully requested.

In the Office Action, the Examiner:

- Rejected claims 3, 4, 9, 10, 11, 13, 14, 18, 20, 22 and 23 under 35 U.S.C §103(a) as being unpatentable over Miller (US Patent No. 5,796,340).
- Rejected claims 2 and 12 under 35 U.S.C §103(a) as being unpatentable over Fraden in view of Miller in view of Sackner (US 2002/0032386).
- Rejected claims 6 under 35 U.S.C §103(a) as being unpatentable over Fraden in view of Miller in view of Cornish (US 2006/0247543).
- Rejected claims 5, 7, 8, 15, 17 and 19 under 35 U.S.C §103(a) as being unpatentable over Fraden in view of Miller in view of Porges (US 4,510,944).
- Rejected claims 8 and 19 under 35 U.S.C §103(a) as being unpatentable over Fraden in view of Miller in view of Sackner in view of Porges.
- Rejected claim 16 under 35 U.S.C §103(a) as being unpatentable over Fraden in view of Miller in view of Sackner in view of Cornish.
- Rejected claim 21 under 35 U.S.C §103(a) as being unpatentable over Fraden in view of Miller in view of Bridger (US 6,491,647).

I. Status Summary

Claim 22 and 23 were amended to emphasize innovative features of the present invention.

No new matter has been introduced by the new claims in the present amendment. Reconsideration of the application as amended and based on the arguments set forth herein below is respectfully requested.

III. Claim Rejection under 35 U.S.C. §103(a)

Claims 11,22 and 23 are patentable over the cited art

Claims 11 is cancelled

Claim 22 and 23 are rejected as being unpatentable under U.S.C. 103(a) over Miller (US 5,796,340)

Claim 22 has been amended to emphasize the differences between the present invention and Miller. The first difference relates to the sensors' arrangement, according to the applicant one sensor is located at lower part of the subject's body and a second one at the upper part.

The examiner states that miller uses multiple sensors. However, all through Miller's document he relates only to a single sensor, the use of the term "sensors" is used only in one sentence, indicating that for analyzing forces(not specifying what forces) different other types of sensors can be used instead of a mattress filled with air : *"This analysis of the forces on a resting or sleeping human applies to **pressure sensors other than mattresses such as sensors placed under or incorporated in the legs or a bed or crib**".* The specific arrangement of sensors according to the applicant defines different relative location of each sensor in reference to the subject's body. Miller is silent regarding the calculation and analysis based on multiple sensors. Miller doesn't mention the type of signals measured by the sensor, whether horizontal or vertical.

The second difference applies to the method of calculating and detecting the heartbeat rate: The applicant discloses the operation of "subtracting the first vertical pressure signal from the second vertical pressure signal", Miller is silent regarding the calculation method and only mention in general the term of "Net force". "Net force" is calculated by summing up forces applied on the center of gravity. The applicant aims to "analyzing horizontal movements of the body's center of gravity " for detecting the heartbeat rate.

The horizontal movements of the body's center of gravity cannot be detected by calculating the net force as known in the art. The detection of the horizontal movements of the body's center of gravity can be determined specifically by subtracting the first vertical pressure signal from the second vertical pressure signal thereby creating a horizontal signal of, where the vertical pressure signals originated from sensors located in different relative locations in reference to the subject's body.

The situation discussed in Nerwin involved the question of whether separating an integral structure or process into elements is patentable.

"such a distinction is merely the separating into two tasks/devices a process which was previously performed as integral to another process/device. Such a distinction is not patentably distinguishing, since it has held that constructing a formerly integral structure in various elements involves only routine skill in the art. Nerwin v. Erlichman, 168 USPQ 177, 179.

The differences between the claimed invention and Miler is more than merely disclosing the calculation steps of a "net force", but rather a new innovative method for extracting heartbeat rate by measuring horizontal movements of the body's center of gravity based on subtracting the first vertical pressure signal from the second vertical pressure signal thereby creating a horizontal signal, where said vertical signals originated from sensors located in different relative locations in reference to the subject's body.

Regarding claims 3 and 13, Miller only discloses giving an indication of respiratory based on mattress pressure: *"Thus, the changes in pressure in the interior region 38 of mattress 22 **will give some indication of respiratory and cardiac action**",* for this purpose, of giving an indication of respiratory, Miller uses a mattress filled with air: *" If the surface of the mattress 22 is airtight, and the interior region of the mattress is filled with air, then the air pressure within the mattress would vary as the force ma 36 varies"*. The applicant identification of the respiration is based on detected horizontal movements of the subject's body center of gravity according to measurements of pressure sensors located in different relative location in reference to the subject's body.

Regarding claims 4 and 14, miller only mentions the "net force" parameter, which is the sum of the forces applied on the center of mass of the body. Miler is silent regarding calculation of horizontal signal and combination thereof with the sum of vertical signals.

The use of specific sensor arrangement having different relative location in reference to the subject's body and disclosing unique method of detection of horizontal movements of center of gravity by subtracting the two signals, cannot be regarded as merely duplication of the mattress filled with air as disclosed in Miller.

The examiner refers to St. Regis Paper Co. VC. Bemis Co, 193 USPQ, stating that mere duplication of the essential working parts of a device involves only routine skill in the art., In Regis case, the inventor used duplicate layers of bags to make a stronger product, which is an obvious result.

Regis further states what can be regarded as inventive step: *"Unless the combination is 'synergistic, that is, 'result(ing) in an effect greater than the sum of the several effects taken separately,' " it cannot be patented. Id., citing Anderson's Black Rock v. Pavement Co., 396 U.S. 57, 61, 90 S.Ct. 305, 24 L.Ed.2d 258 (1969)."*

. The applicant discloses an innovative synergistic combination of the sensors arrangement and analysis method, which provides new results of detecting horizontal movements of the center of gravity, which is not anticipated by Miller. Based on the detected horizontal movements of center of gravity and the horizontal signal, are extracted the measurement of subject's heartbeat rate, which are significantly different from prior art heartbeat measurements enabling to identify changes in the heartbeat rate which otherwise couldn't be detected. The applicant encloses in Exhibit A, lab test results demonstrating the difference of detected measurements between summation of four signals at the first graph (Fig. 1) and the subtraction of two pairs of signals at the second graph (Fig. 2). It can be seen that the measurements at the second graph are significantly more valuable enabling to identify heartbeat rate, where at first graph the heartbeat rate is undetectable.

Regarding claims 10 and 20, the examiner cites Col 3 23-29, where Miller only demonstrates the basic principles of physics describing the exerted forces applied on the human body and the reaction forces, not mentioning or suggesting to measure horizontal signals or detecting horizontal movements of the subject's center of gravity. For the sake of clarity, movements of the subject's center of gravity are not equivalent to the movements of the subject.

The dependent claims are patentable over the cited art.

The patentability of dependent claims 3, 4, 10, 13, 20, 24 was discussed above. All the other claims are patentable at least in virtue of being dependent, directly or indirectly, on a patentable independent claim.

Conclusion

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If there any fees in addition to those being paid herewith for this Amendment, please charge the same to our deposit account 504438.

Respectfully submitted,

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